

FIGURE 1A

CTCGAGGACAGTGACCTGGGAGTGAGTACAAGGTGAGGCCACCACTCAGGGT
GCCAGCTCCAAGCGGGTCACAGGGACGAGGGGCTGCGGCCATCAGGAGGCCCT
GCACACACATCTGGGACACGCGCCCCCGAGGGCCAGTTCACCTCAGTGCGCCT
CATTTCTCCTGCACAAAAGCGCCCCCATCCTTTCTTTCACAAGGCTTTCGTGGAAG
CAGAGGCGTCGATGCCCAGTACCCTCTCCCTTTCCCAGGCAACGGGACCCCAA
GTTTGCTGACTGGGACCACCAAGCCACGCATGCGTCAAGAGTGAGAGTCCGG
GACCTAGGCAGGGGGCCCTGGGGTTGGGCCTGAGAGAGAAGAGAACCTCCCC
AGCACTCGGTGTGCATCGGTAGTGAAGGAGCCTCACCTGACCCCGCTGTTGC
TCAATCGACTTCCCAAGAACAGAGAGAAAAGGGAACCTCCAGGGCGGCCCGG
GCCTCCTGGGGGTTCACACCCCATTTTTAGCTGAAAGCACTGAGGCAGAGCTC
CCCCTACCCAGGCTCCACTGCCCGGCACAGAAATAACAACCACGGTTACTGAT
CATCTGGGAGCTGTCCAGGAATTC

Germ-line Locus

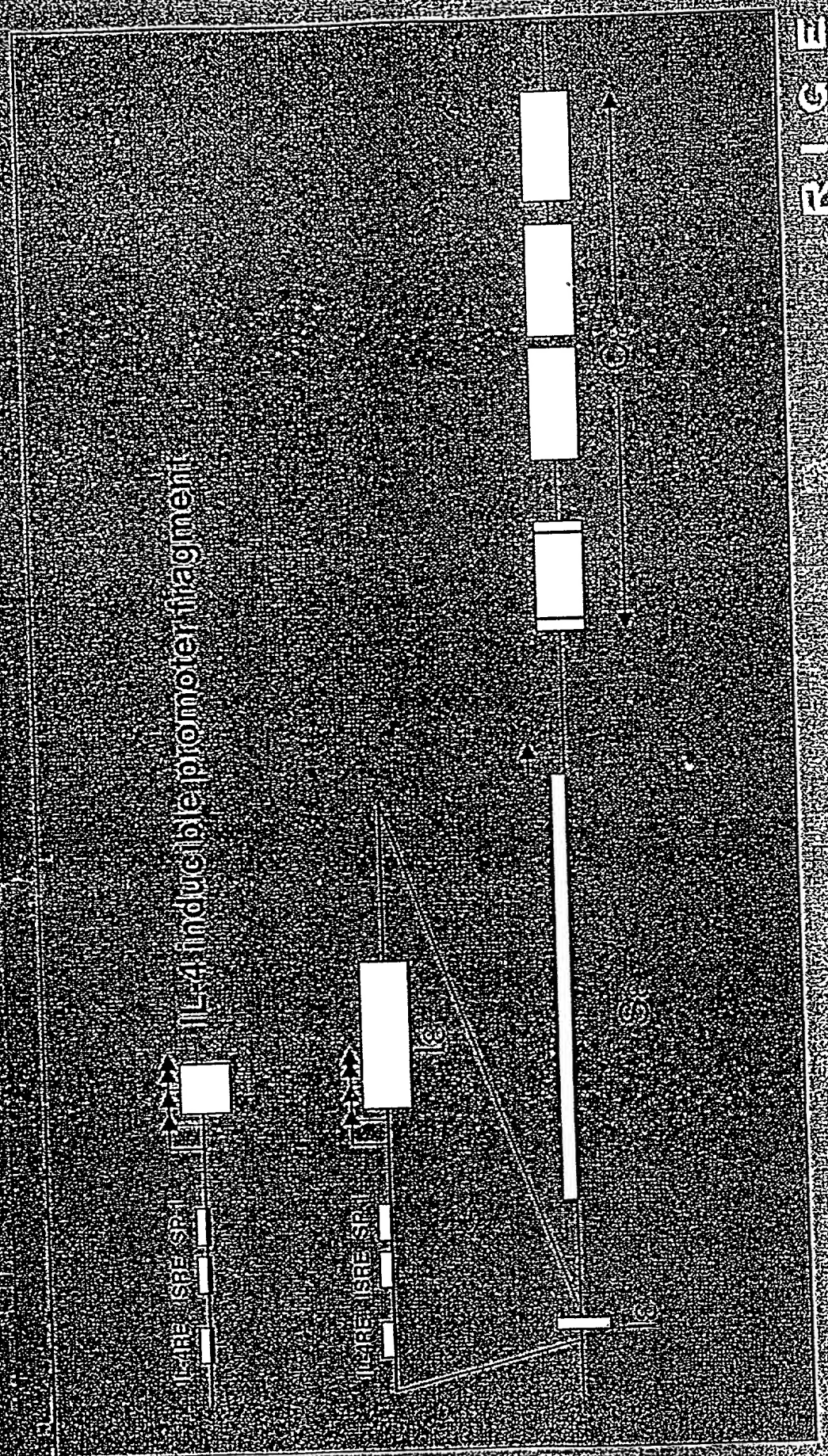


FIGURE 1B

Low energy DNA folding of the S_{ϵ} region

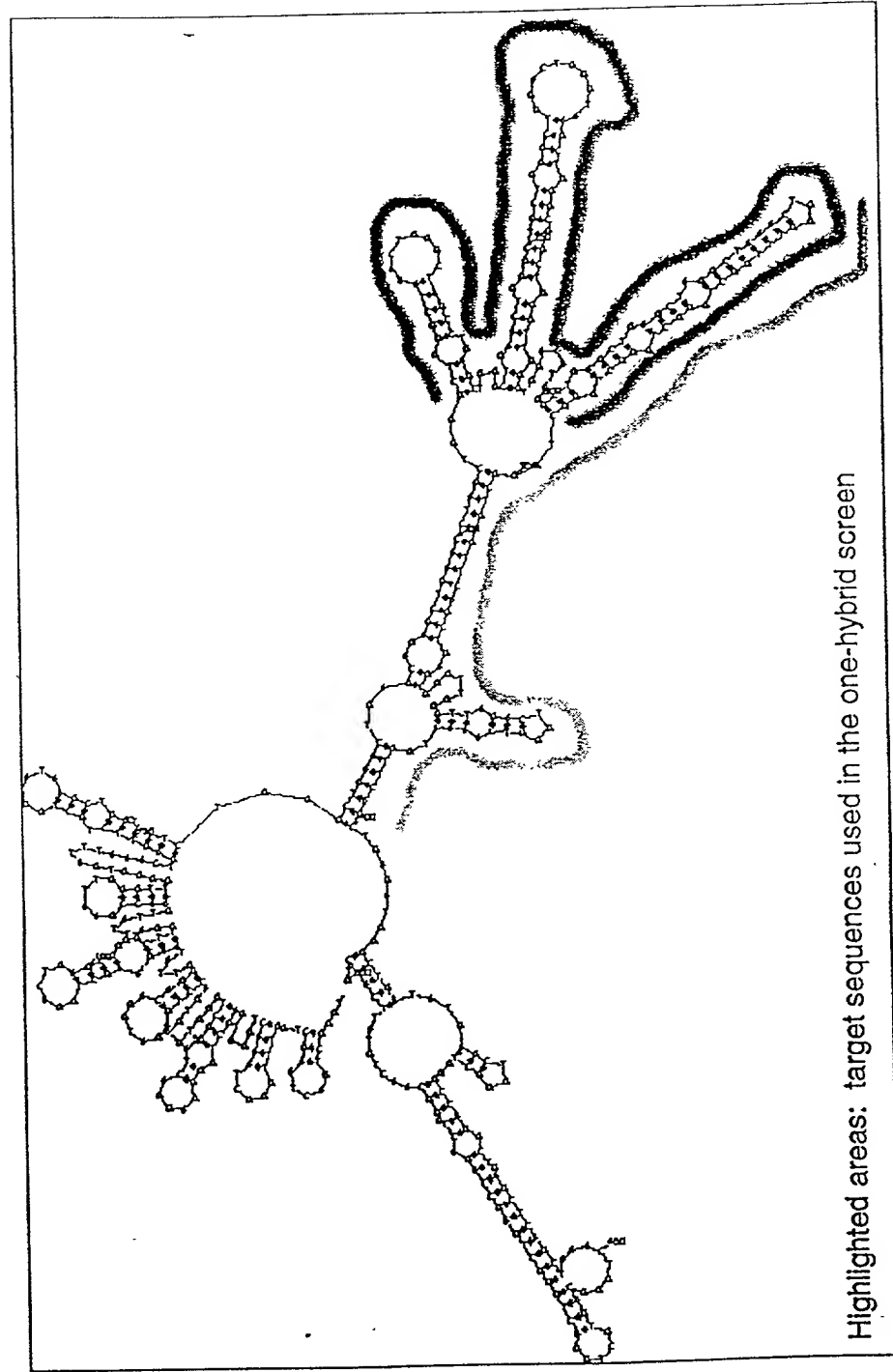


FIG 2A

FIGURE 2B

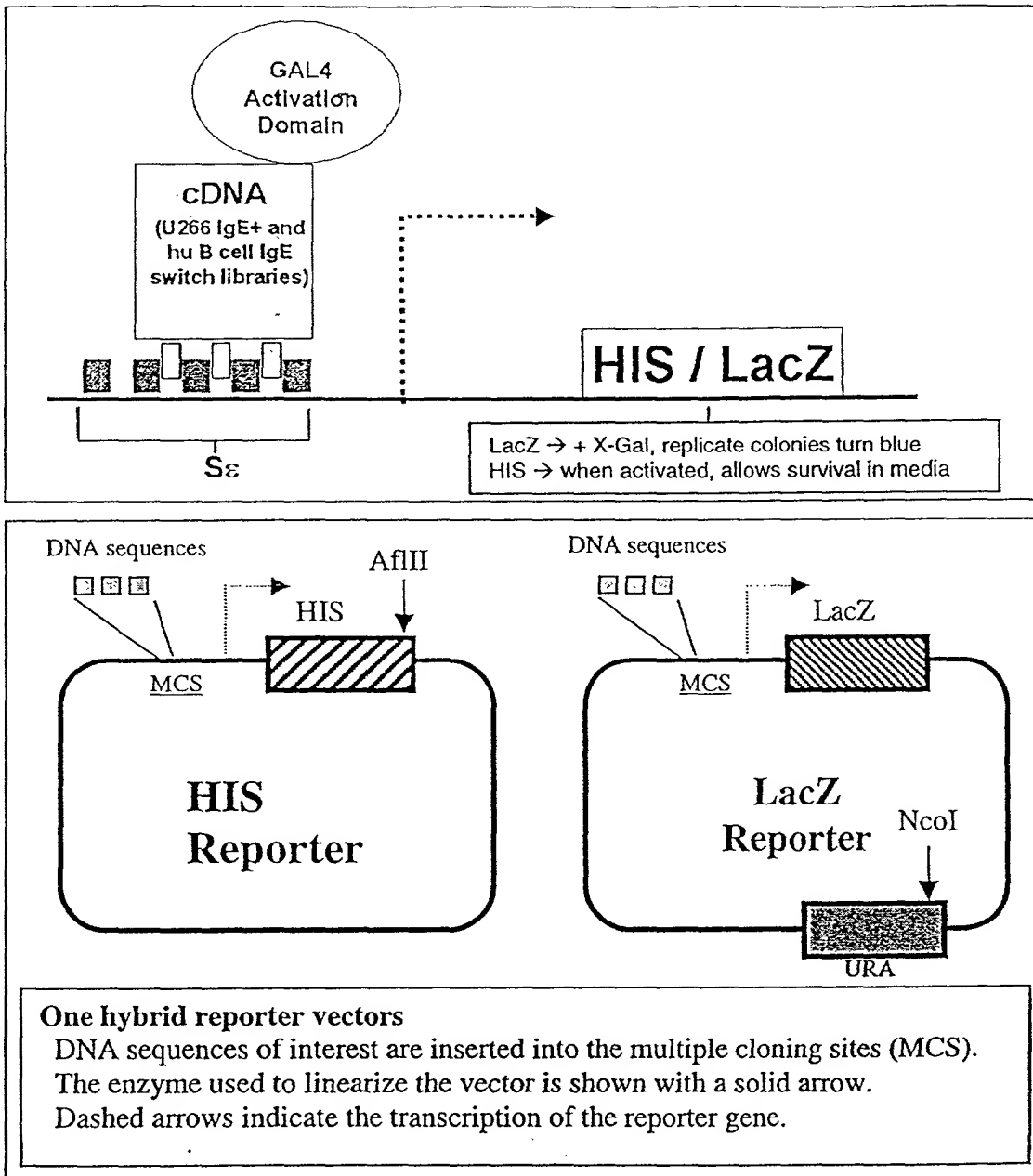
1 GCTGGGCTAA ACTGGGCTAG CCTGAGCTGG GCTGAACTGG GCTGCTGGGC
51 TGGACTGGGT AAGCTGGGCT GAGCTGGGTT GGGTGGAAAT GGGCTGAGCT
101 GAGCTAGGCT AACTGGGTT TGGCTGGGCT GGGCTGGGCT GGG

FIGURE 2C

1 GGTTTGGCTG GGCTGGGCTG GGCTGGGCTG GGTCAGCTG AGCGGGTTGG
51 GTTAGACTGG GTCAAAGTGG TTCAGC

FIG 3

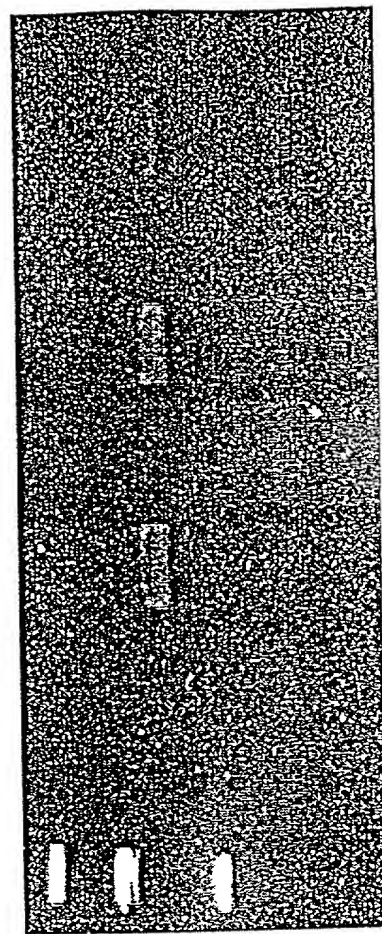
Appendix F Yeast One-Hybrid Screening



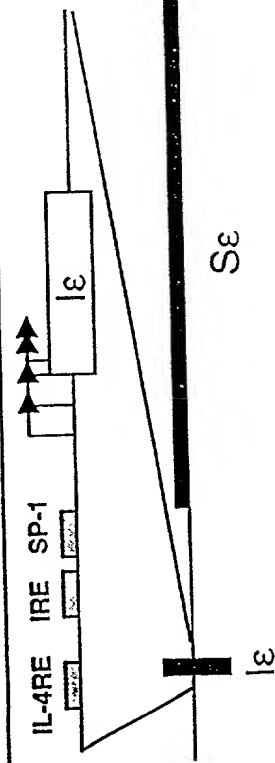
IL-4 Induction of Germline ϵ mRNA in the IgM+ B cell lines: CA-46, MC-116 and DND39

Cells were incubated for 48 hrs in 300 U/ml of h-IL-4. RT-PCR was performed using primers specific for the germline ϵ exon and the 5'-end of the ϵ CH1 exon (predicted size ~ 200 bp).

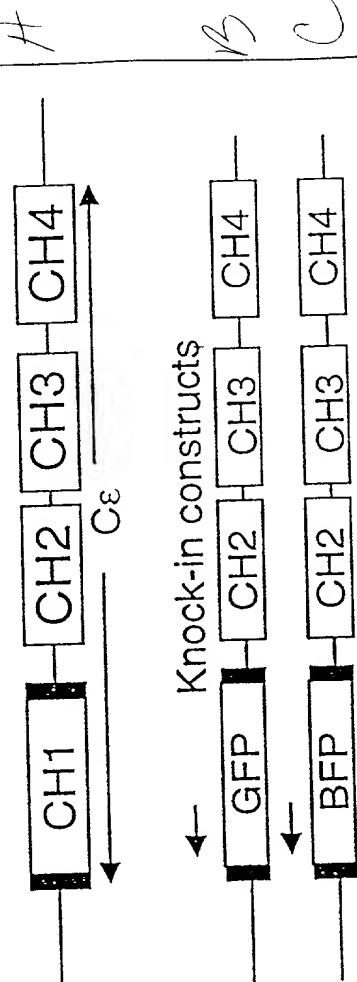
DND39 + IL-4
DND39 - IL-4
MC-116 + IL-4
MC-116 - IL-4
CA-46 + IL-4
CA-46 - IL-4
Neg cont.



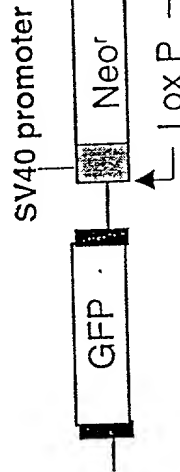
Approaches to generate germline ϵ promoter knock-in reporter cell lines



IL-4 inducible IgM+ B cell lines are transfected. Under the influence of IL-4, GFP and/or BFP positive clones are isolated by FACS. Homologous recombination can be confirmed by PCR and/or Southern blot hybridization.



IL-4 inducible IgM+ B cell lines are transfected and selected with G418. Survivors are sorted for the lack of 3' BFP expression (deleted during homologous recombination). RT-PCR is performed to confirm homologous recombination. Those clones are transfected with *cre* to remove the neomycin resistance gene.



Constitutive Promoter

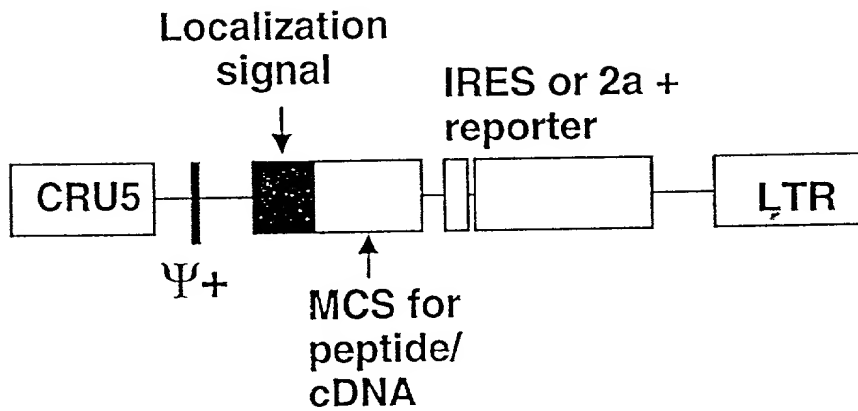
IL-4 RE, IL-4 responsive element
IRE, interferon responsive element
SP-1, SP-1 binding site
Iε, non-translated exon
Sε, switch region of ϵ
GFP, green fluorescent protein
BFP, blue fluorescent protein
CH1,2,3,4, constant region domain exons

Appendix A

FIG 6

Appendix I

Rigel Base Vector



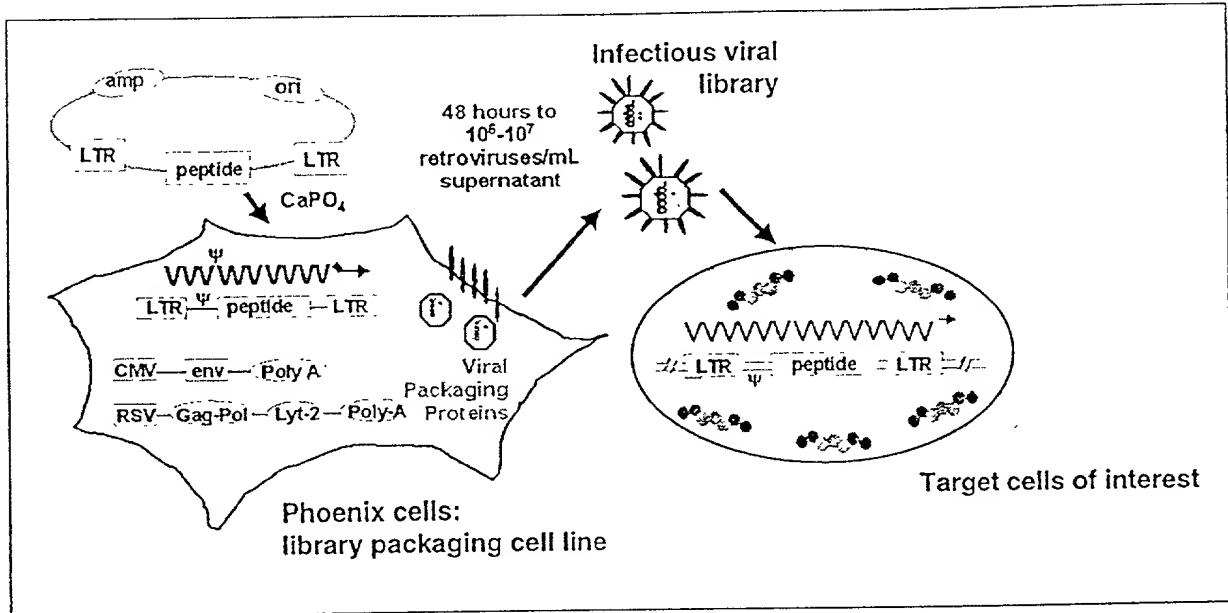
All components are cassetted for flexibility

CRU5, modified LTR
LTR, long terminal repeat
Ψ+, packaging signal
Localization signal: nuclear, cell membrane, granular
MCS, multiple cloning site
IRES, internal ribosome entry site
2a, self-cleaving peptide

FIG 7

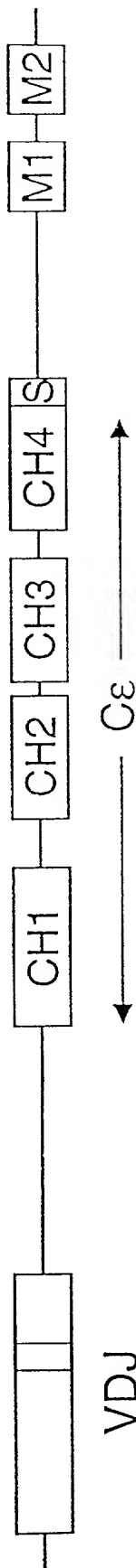
Appendix H

Protocol for Transfection of Phoenix Cells and Infection of Nonadherent Target Cells

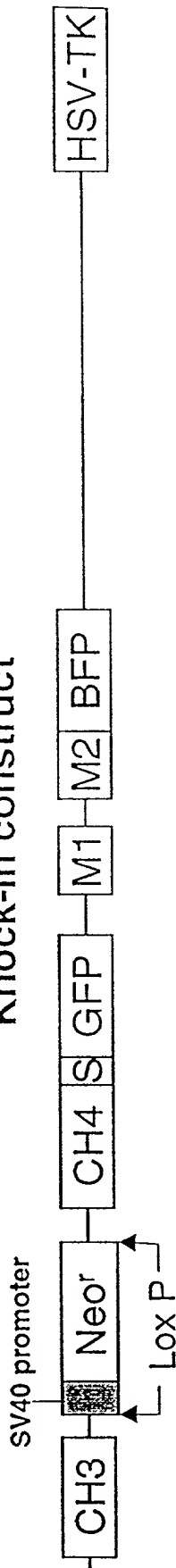


ϵ heavy chain GFP/BFP knock-in cell line

U266 ϵ heavy chain



Knock-in construct



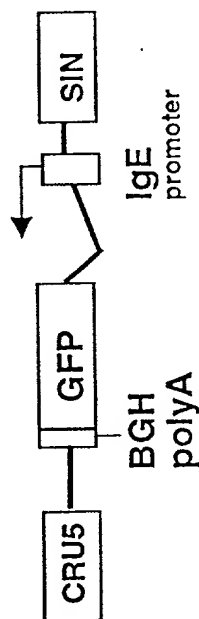
U266 cells are transfected and selected with G418. Survivors are treated with ganciclovir (HSV-TK deleted during homologous recombination). RT-PCR is performed to confirm homologous recombination. Those clones are transfected with *cre* to remove the SV40 neomycin resistance gene.

S, secretory exon
 GFP, green fluorescent protein
 BFP, blue fluorescent protein
 Neo^r, neomycin resistance gene
 VDJ, V region exon
 CH1,2,3,4, constant region domain exons
 M1, M2, membrane exons
 HSV-TK, Herpes Simplex virus-Thymidine Kinase

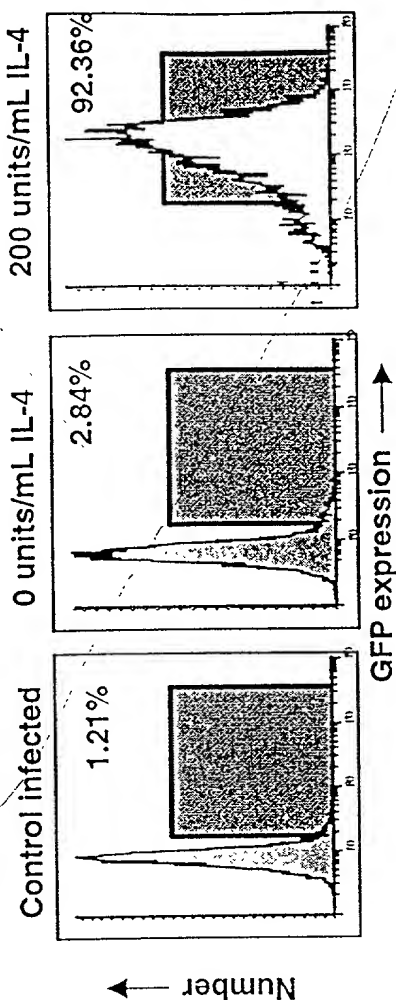
Appendix D

IL-4 Inducible ε Promoter Reporter Cell Line

Reporter construct

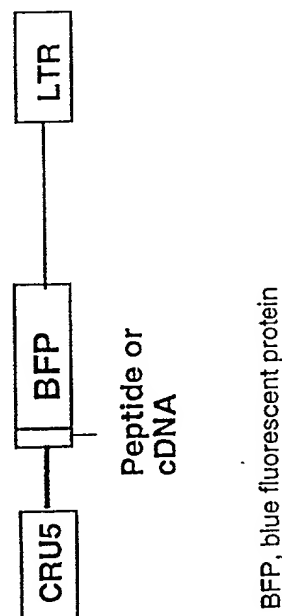


IL-4 induced reporter

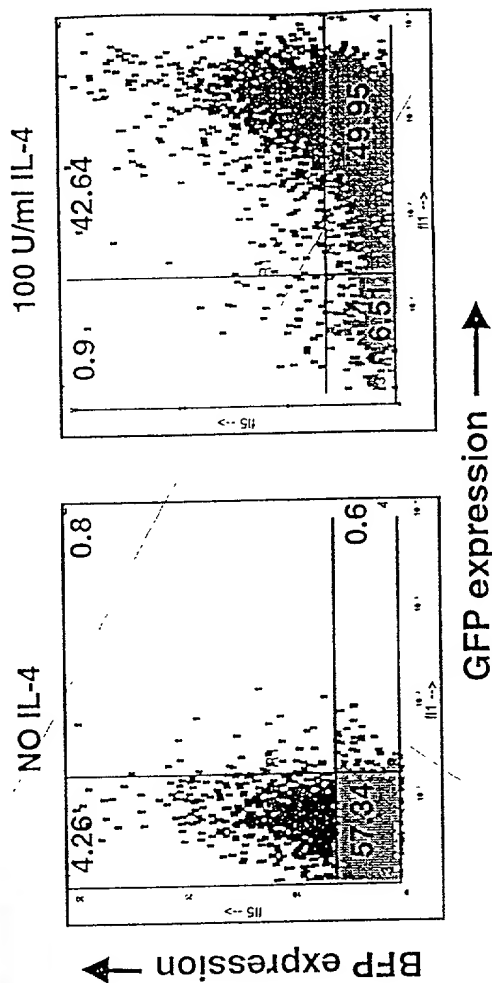


Reporter Line Infected with BFP Construct

Library construct

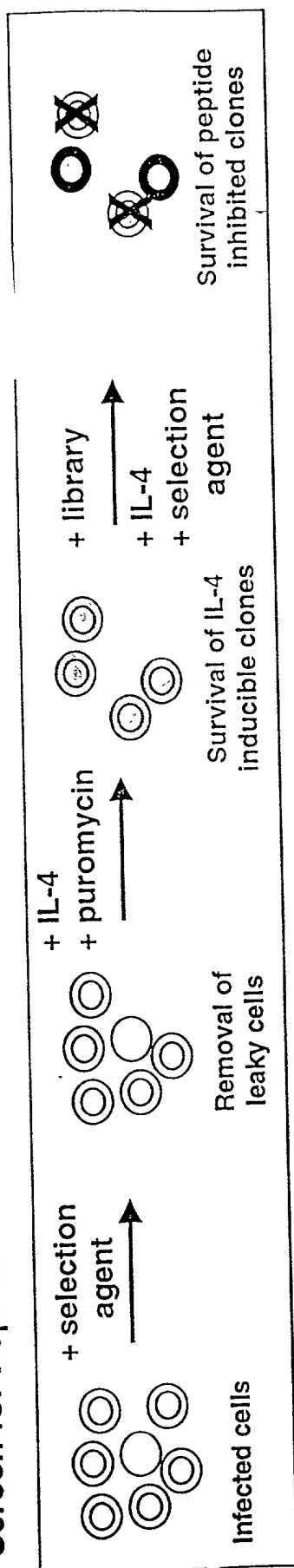


FACS profile of cells with both reporter and peptide library

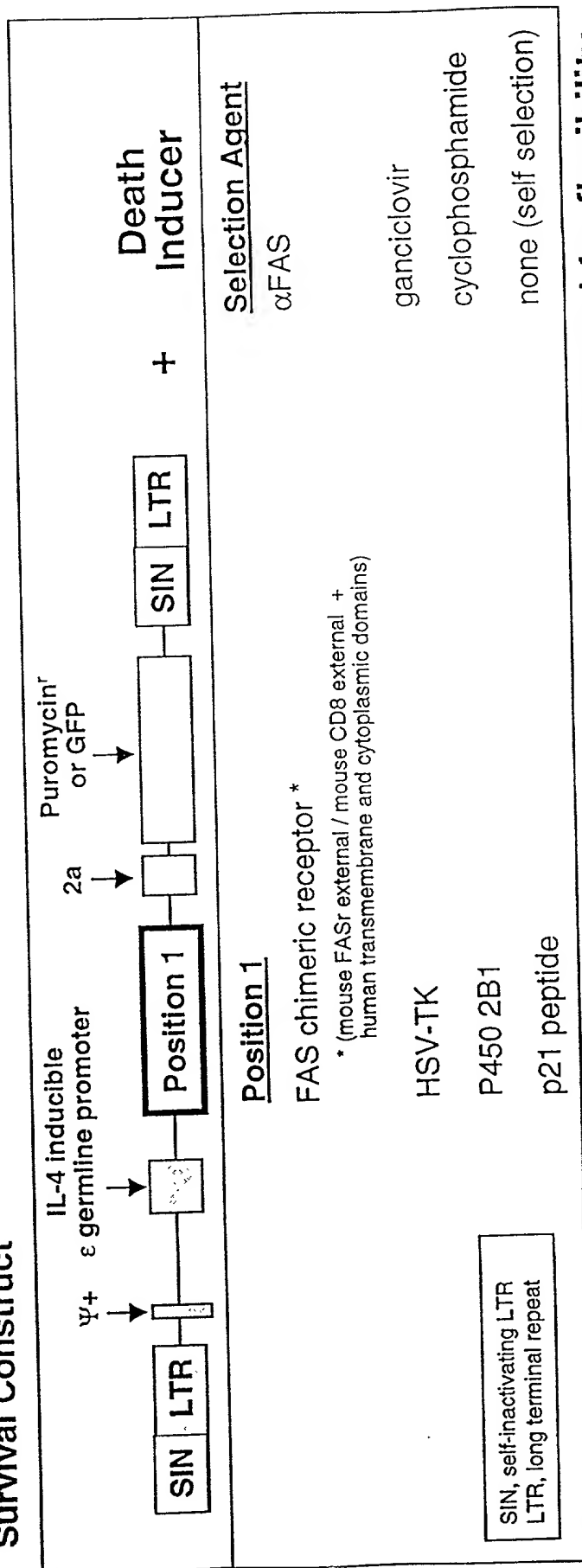


Appendix C

Screen for Peptide Inhibitors of the Germline ε Promoter



Survival Construct



All components are cassetted for flexibility

Appendix D

FIGURE 11A-1

1-845 CMV promoter/R/U5 5' LTR
 1322 GAG ATG-ATC mutation
 850-2100 extended Ψ region
 2146-2173 two Bstx1 peptide cloning sites
 2205-2723 ECMV IRES (cloned as EcoR1/MscI fragment from
 pCITE-4a [Novagen])
 2746-3465 GFP coding region
 3522-4115 3' LTR
 4122-6210 pGEM backbone (pUC origin, ampR)

ATCACGAGGCCCTTTCGTCTTCAAGAACAGCTTTGCTCTTAGGAGTTTCCTAATACATCC
 CAAACTCAAATATATAAAGCATTGTGACTTGTCTATGCCCTAGTTATTAATAGTAATCAA
 TTACGGGGTCATTAGTTTCATAGCCCATATATGGAGTTCGCGTTACATAACTTACGGTAA
 ATGGCCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGT
 AAACTGCCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACG
 TCAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTC
 CTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGC
 AGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTCTCCACCCCA
 TTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTA
 ACAACTCCGCCCCATTGACGCAAAATGGGCGGTAGGCATGTACGGTGGGAGGTCTATATAA
 GCAGAGCTCAATAAAAGAGCCCAACCCCTCACTCGGGGCGCCAGTCTCCGATTGACT
 GAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTGCAGTTGCATCCGACTTGTGGT
 CTCGCTGTTCCCTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTT
 CATTTGGGGGCTCGTCCGGGATCGGGAGACCCCTGCCAGGGACCACCGACCCACCACCG
 GGAGGTAAGCTGGCCAGCAACTTATCTGTGTCTGTCCGATTGTCTAGTGTCTATGACTGA
 TTTTATGCGCCTGCGTCCGTACTAGTTAGCTAACTAGCTCTGTATCTGGCGGACCCGTGG
 TGGAAGTACGAGTTTCGGAACACCCGGCCGCAACCCTGGGAGACGTCCCAGGGACTTCGG
 GGGCCGTTTTTGTGGCCCGACCTGAGTCCAAAAATCCCGATCGTTTTTGGACTCTTTGGTG
 CACCCCCCTTAGAGGAGGGATATGTGGTTCTGGTAGGAGACGAGAACCTAAACAGTTCC
 CGCCTCCGTCTGAATTTTTGCTTTTCGGTTTGGGACCGAAGCCGCGCCGCGCTTGTCT
 GCTGCAGCATCGTTCTGTGTTGTCTCTGTCTGACTGTGTTTCTGTATTGTCTGAAAATA
 TCGGCCCCGGGCCAGACTGTTACCACTCCCTTAAGTTTGACCTTAGGTCACCTGGAAAGATG
 TCGAGCGGATCGCTCACAACCAGTCGGTAGATGTCAAGAAGAGACGTTGGGTACCTTCT
 GCTCTGCAGAATGGCCAACCTTTAACGTCGGATGGCCGCGAGACGGCACCTTTAACCGAG
 ACCTCATCACCCAGGTTAAGATCAAGGCTTTTACCTGGCCCGCATGGACACCCAGACC
 AGGTCCCCCTACATCGTGACCTGGGAAGCCTTGGCTTTTGACCCCCCTCCCTGGGTCAAGC
 CCTTTGTACACCCTAAGCCTCCGCCTCCTCTTCCCTCCATCCGCCCCGTCTCTCCCCCTTG
 AACCTCCTCGTTTCGACCCCCGCTCGATCCTCCCTTTATCCAGCCCTCACTCCTTCTCTAG
 GCGCCCCCATATGGCCATATGAGATCTTATATGGGGCACCCCCGCCCCCTTGTAACCTTCC
 CTGACCTTGACATGACAAGAGTTACTAACAGCCCCCTCTCTCCAAGCTCACTTACAGGCTC
 TCTACTTAGTCCAGCACGAAGTCTGGAGACCTCTGGCGGCAGCCTACCAAGAACAAGTGG
 ACCGACCGGTGGTACCTCACCTTACCGAGTCGGCGACACAGTGTGGGTCCGCCGACACC
 AGACTAAGAACCTAGAACCTCGCTGGAAAGGACCTTACACAGTCCTGCTGACCACCCCCA
 CCGCCCTCAAAGTAGACGGCATCGCGCTTGGATACACGCCGCCACGTGAAGGCTGCCGA
 CCCCCGGGGTGGACCATCCTCTAGACTGCCGGATCTCGAGGGATCCACCACCATGGACCC
 CCATTAAATTGGAATTCCTGCAGCCCCGGGGGATCCACTAGTTCTAGAGCGAATTAATTC

[illegible]

GGTTATTTTCCACCATATTGCCGCTCTTTTGGAATGTGAGGGCCCGGAAACCTGGCCCTG
TCTTCTTTGACGAGCATTCCTAGGGGTCTTTCCCTCTCGCCAAAGGAATGCAAGGTCTGT
TGAATGTTCGTGAAGGAAGCAGTTCCCTCTGGAAGCTTCTTGAAGACAAACAACGTCTGTAG
CGACCCCTTTGCAGGCAGCGGAACCCCCACCTGGCGACAGGTGCCCTCTGCGGCCAAAAGC
CACGTGTATAAGATACACCTGCAAAGGCGGCACAACCCAGTGCCACGTTGTGAGTTGGA
TAGTTGTGGAAGAGTCAAATGGCTCTCCTCAAGCGTATTCAAACAAGGGGCTGAAGGATG
CCCAGAAGGTACCCCATTTGTATGGGATCTGATCTGGGGCCTCGGTGCACATGCTTTACAT
GTGTTTAGTTCGAGGTTAAAAAACGTCTAGGCCCCCGAACCACGGGGACGTGGTTTTCTC
TTGAAAAACACGATGATAATATGGGGGATCCACCGGTCGCCACCATGGTGAGCAAGGGCG
AGGAGCTGTTACCGGGGTGGTGCCCATCCTGGTCGAGCTGGACGGCGACGTAAACGGGC
ACAAGTTCAGCGTGTCCGGCGAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGA
AGTTTCATCTGCACCACCGGCAAGCTGCCCGTGCCCTGGCCCACCCTCGTGACCACCCTGA
CCTACGGCGTGCAGTGCTTCAGCCGCTACCCCGACCACATGAAGCAGCACGACTTCTTCA
AGTCCGCCATGCCCCGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGCA
ACTACAAGACCCGCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGC
TGAAGGGCATCGACTTCAAGGAGGACGGCAACATCCTGGGGCACAAGCTGGAGTACAAC
ACAACAGCCACAACGTCTATATCATGGCCGACAAGCAGAAGAACGGCATCAAGGTGAAC
TCAAGATCCGCCACAACATCGAGGACGGCAGCGTGCAGCTCGCCGACCACTACCAGCAGA
ACACCCCATCGGCGACGGCCCCGTGCTGCTGCCCGACAACCCTACCTGAGCACCCAGT
CCGCCCTGAGCAAAGACCCCAACGAGAAGCGCGATCACATGGTCTGCTGGAGTTCGTGA
CCGCCCGCGGGATCACTCTCGGCATGGACGAGCTGTACAAGTAAAGCGGCCGCTCGACGA
TAAATAAAAGATTTTTATTAGTCTCCAGAAAAAGGGGGGAATGAAAGACCCACCTGTA
GGTTTGGCAAGCTAGCTTAAGTAACGCCATTTTGCAAGGCATGGAAAAATACATAACTGA
GAATAGAGAAGTTCAGATCAAGGTCAGGAACAGATGGAACAGCTGAATATGGGCCAAACA
GGATATCTGTGGTAAGCAGTTCCCTGCCCCGGCTCAGGGCCAAGAACAGATGGAACAGCTG
AATATGGGCCAAACAGGATATCTGTGGTAAGCAGTTCCCTGCCCCGGCTCAGGGCCAAGAA
CAGATGGTCCCCAGATGCGGTCCAGCCCTCAGCAGTTTCTAGAGAACCATCAGATGTTTC
CAGGGTGCCCCAAGGACCTGAAATGACCCTGTGCCTTATTTGAACTAACCAATCAGTTTCG
CTTCTCGCTTCTGTTTCGCGCGCTTCTGCTCCCCGAGCTCAATAAAAGAGCCCACAACCC
TCACTCGGGGCGCCAGTCCCTCCGATTGACTGAGTCGCCCGGGTACCCGTGTATCCAATAA
ACCCTCTTGCAGTTGCATCCGACTTGTGGTCTCGCTGTTCCCTTGGGAGGGTCTCCTCTGA
GTGATTGACTACCCGTCAGCGGGGGTCTTTCATTTCCGACTTGTGGTCTCGCTGCCTTG
GAGGGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTCACATGCAGCATGTAT
CAAAATTAATTTGGTTTTTTTTTCTTAAGTATTTACATTAAATGGCCATAGTTGCATTAAT
GAATCGGCCAACGCGCGGGGAGAGGCGGTTTGCGTATTGGCGCTCTTCCGCTTCTCTCGCT
CACTGACTCGCTGCGCTCGGTTCGCTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGG
GGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAAGAACATGTGAGCAAAAGG
CCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTCGCTGGCGTTTTTCCATAGGCTCCG
CCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGG
ACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGAC
CCTGCCGCTTACCGGATACCTGTCCGCCTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCA
TAGCTCACGCTGTAGGTATCTCAGTTTCGGTGTAGGTTCGTTTCGCTCCAAGCTGGGCTGTGT
GCACGAACCCCCGTTTCAGCCCGACCGCTGCGCCTTATCCGGTAACATATCGTCTTGAGTC
CAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAG
AGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAAGTGGTGGCCTAACTACGGCTACAC
TAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGT
TGGTAGCTCTTGATCCGGCAAACAACACCGCTGGTAGCGGTGGTTTTTTTGTGTTGCAA
GCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGG
GTCTGACGCTCAGTGGAACGAAAAATCAGTTAAGGATTTTGGTCATGAGATTATCAAA
AAGGATCTTCACCTAGATCTTTTTAAATTAATAAGTAAAGTTTGGCATAATCAATCAAA
TATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTC
AGCGATCTGTCTATTTTCGTTTCATCCATAGTTGCCTGACTCCCCGTGCTGTAGATAACTAC
GATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTC
ACCGGCTCCAGATTTATCAGCAATAAACACAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGG

FIGURE 11A-3

TCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGAAGCTAGAGTAAG
TAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTC
ACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTAC
ATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAG
AAGTAAGTTGGCCGCGAGTGTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTAC
TGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTG
AGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAACACGGGATAATACCGC
GCCACATAGCAGAACTTTAAAAGTGCTCATCATTTGGAAAACGTTCTTCGGGGCGAAAAC
CTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAAACCCACTCGTGACCCCAACTG
ATCTTCAGCATCTTTTACTTTTACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA
TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTT
TCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTGAATG
TATTTAGAAAAATAAACAAATAGGGGTTCCGCGCACATTC

TCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGAAGCTAGAGTAAG

FIGURE 11B-1

1-845 CMVpormoter/R/U5 5' LTR
1322 GAG ATG-ATC mutation
850-2100 extended □ region
2151-2865 GFP coding region
2866-2894 GGS SGGG linker
2895-2952 FMDV 2a cleavage sequence
2953-3004 Bstx1/Bstx1/HinD3/Hpa1/Sal1/Not1 polylinker
3052-3645 3' LTR
3652-5715 pGEM backbone (pUC origin, ampR)

ATCACGAGGCCCCTTTCGTCTTCAAGAACAGCTTTGCTCTTAGGAGTTTQCTAATACATC
CCAAACTCAAATATATAAAGCATTTGACTTGTTCTATGCCCTAGTTATTAATAGTAATC
AATTACGGGGGTCATTAGTTCATAGCCCATATATGGAGTTCCGCGTTACATAACTTACGG
TAAATGGCCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACG
TATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
ACGGTAAACTGCCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTA
TTGACGTCAATGACGGTAAATGGCCCCGCCTGGCATTATGCCCAGTACATGACCTTATGG
GACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATGCG
GTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTGAATCACGGGGATTTCGAAGTC
TCCACCCCATTGACGTCAATGGGAGTTTGTGTTTGGCACCAAAATCAACGGGACTTTCCA
AAATGTCGTAACAACCTCCGCCCCATTGACGCAAATGGGCGGTAGGCATGTACGGTGGGA
GGTCTATATAAGCAGAGCTCAATAAAAGAGCCCACAACCCCTCACTCGGGGCGCCAGTC
CTCCGATTGACTGAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTGACGTTGCA
TCCGACTTGTGGTCTCGCTGTTTCCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGT
CAGCGGGGGTCTTTTCATTTGGGGGCTCGTCCGGGATCGGGAGACCCCTGCCCAGGGACC
ACCGACCCACCACCGGGAGGTAAGCTGGCCAGCAACTTATCTGTGTCTGTCCGATTGTC
TAGTGTCTATGACTGATTTTATGCGCCTGCGTCGGTACTAGTTAGCTAACTAGCTCTGT
ATCTGGCGGACCCGTGGTGGAACTGACGAGTTCGGAACACCCGGCCGCAACCCTGGGAG

FIGURE 11B-2

ACGTCCCAGGGACTTCGGGGGCGGTTTTGTGGCCCGACCTGAGTCCAAAAATCCCGAT
CGTTTTGGACTCTTTGGTGCACCCCCCTTAGAGGAGGGATATGTGGTTCTGGTAGGAGA
CGAGAACCTAAAACAGTTCCCGCCTCCGTCTGAATTTTTGCTTTTCGGTTTGGGACCGAA
GCCGCGCCGCGCGTCTTGTCTGCTGCAGCATCGTTCTGTGTTGTCTCTGTCTGACTGTG
TTTCTGTATTTGTCTGAAAATATCGGCCCCGGGCCAGACTGTTACCACTCCCTTAAGTTT
GACCTTAGGTCACTGGAAAGATGTGAGCGGATCGCTCACAACCAGTCGGTAGATGTCA
AGAAGAGACGTTGGGTACCTTCTGCTCTGCAGAATGGCCAACCTTTAACGTCGGATGG
CCGCGAGACGGCACCTTTAACCGAGACCTCATCACCCAGGTAAAGATCAAGGTCTTTTC
ACCTGGCCCCGCATGGACACCCAGACCAGGTCCCCTACATCGTGACCTGGGAAGCCTTGG
CTTTTGACCCCCCTCCCTGGGTCAAGCCCTTTGTACACCCTAAGCCTCCGCCTCCTCTT
CCTCCATCCGCCCCGTCTCTCCCCCTTGAACCTCCTCGTTTCGACCCCGCCTCGATCCTC
CCTTTATCCAGCCCTCACTCCTTCTCTAGGCGCCCCCATATGGCCATATGAGATCTTAT
ATGGGGCACCCCCCGCCCCCTTGTAACCTTCCCTGACCCTGACATGACAAGAGTTACTAAC
AGCCCCCTCTCTCCAAGCTCACTTACAGGCTCTCTACTTAGTCCAGCACGAAGTCTGGAG
ACCTCTGGCGGCAGCCTACCAAGAACAACCTGGACCGACCGGTGGTACCTCACCTTACC
GAGTCGGCGACACAGTGTGGGTCCGCGGACACCAGACTAAGAACCTAGAACCTCGCTGG
AAAGGACCTTACACAGTCTGCTGACCACCCCCACCGCCCTCAAAGTAGACGGCATCGC
AGCTTGGATACACGCCGCCACGTGAAGGCTGCCGACCCCGGGGTGGACCATCCTCTA
GACTGCCGGATCTCGAGGGATCCACCATGGTGAGCAAGGGCGAGGAGCTGTTACCGGG
GTGGTGCCCATCCTGGTCGAGCTGGACGGCGACGTAAACGGCCACAAGTTCAGCGTGTC
CGGCGAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGAAGTTCATCTGCACCA
CCGGCAAGCTGCCCCGTGCCCTGGCCCCACCTCGTGACCACCTGACCTACGGCGTGACG
TGCTTCAGCCGCTACCCCGACCACATGAAGCAGCACGACTTCTTCAAGTCCGCCATGCC
CGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGCAACTACAAGACCC
GCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGCTGAAGGGCATC
GACTTCAAGGAGGACGGCAACATCCTGGGGCACAAGCTGGAGTACAACCTACAACAGCCA
CAACGTCTATATCATGGCCGACAAGCAGAAGAACGGCATCAAGGTGAACCTCAAGATCC
GCCACAACATCGAGGACGGCAGCGTGCAGCTCGCCGACCACTACCAGCAGAACACCCCC
ATCGGCGACGGCCCCGTGCTGCTGCCCCGACAACCACTACCTGAGCACCCAGTCCGCCCT
GAGCAAAGACCCCAACGAGAAGCGCGATCACATGGTCCTGCTGGAGTTCGTGACCGCCG
CCGGGATCACTCTCGGCATGGACGAGCTGTACAAGGAATTCGGAGGTGGCAGCGGTGGC
GGTCAGCTGTTGAATTTTGACCTTCTTAAACTTGCGGGAGACGTGAGTCCAACCCTGG
GCCACCACCACCATGGAAGCTTCCATTAAATTGGTTAACGTCGACGCGGCCGCTCGAC
GATAAAATAAAAGATTTTATTTAGTCTCCAGAAAAAGGGGGGAATGAAAGACCCACCT
GTAGGTTTGGCAAGCTAGCTTAAAGTAACGCCATTTTGCAAGGCATGGAAAAATACATAA
CTGAGAAATAGAGAAGTTCAGATCAAGGTCAGGAACAGATGGAACAGCTGAATATGGGCC
AAACAGGATATCTGTGGTAAGCAGTTTCTGCCCCGGCTCAGGGCCAAGAACAGATGGAA
CAGCTGAATATGGGCCAAACAGGATATCTGTGGTAAGCAGTTTCTGCCCCGGCTCAGGG
CCAAGAACAGATGGTCCCCAGATGCGGTCCAGCCCTCAGCAGTTTCTAGAGAACCATCA
GATGTTTCCAGGGTGCCCCAAGGACCTGAAATGACCTGTGCCTTATTTGAACTAACCA
ATCAGTTCGCTTCTCGCTTCTGTTTCGCGCGCTTCTGCTCCCCGAGCTCAATAAAAGAGC
CCACAACCCCTCACTCGGGGCGCCAGTCCTCCGATTGACTGAGTCGCCCCGGGTACCCGT
GTATCCAATAAACCTCTTGCAGTTGCATCCGACTTGTGGTCTCGCTGTTCTTGGGAG
GGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTTCATTTCCGACTTGTGGT
CTCGCTGCCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTCA
CATGCAGCATGTATCAAAATTAATTTGGTTTTTTTTCTTAAGTATTTACATTAAATGGC
CATAGTTGCATTAATGAATCGGCCAACGCGGGGAGAGGCGGTTTGGCGTATTTGGCGCT

FIGURE 11B-3

CTTCCGCTTCCTCGCTCACTGACTCGCTGCGCTCGGTTCGGCTGCGGCGAGCGGTA
TCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAA
GAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGG
CGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAG
AGGTGGCGAAACCCGACAGGACTATAAAGATAACCAGGCGTTTCCCCCTGGAAGCTCCCT
CGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCTTTCTCCCTT
CGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTC
GTTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTT
ATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAG
CAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTG
AAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCT
GAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCG
CTGGTAGCGGTGGTTTTTTTTGTTTTGCAAGCAGCAGATTACGCGCAGAAAAAAGGATCT
CAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACACAG
TTAAGGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATT
AAAAATGAAGTTTTCGCAAATCAATCTAAAGTATATATGAGTAACTTGGTCTGACAGT
TACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTTCGTTTCATCCAT
AGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCC
CCAGTGCTGCAATGATACCGCGAGACCCACGCTCACC GGCTCCAGATTTATCAGCAATA
AACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCAT
CCAGTCTATTAATTGTTGCCGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGC
GCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTACGCTCGTCGTTTGGTATGGCT
TCATTTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAA
AAAAGCGGTTAGCTCCTTCGGTCCCTCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGT
TATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTTCATGCCATCCGTAAGA
TGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCG
ACCGAGTTGCTCTTGCCCGGCGTCAACACGGGATAATACCGCGCCACATAGCAGAACTT
TAAAAGTGCTCATCATTTGGAACCGTTCTTCGGGGCGAAAACCTCTCAAGGATCTTACCG
CTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTTT
TACTTTTACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAGG
GAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTCAATATTATTGA
AGCATTTATCAGGGTTATTGTCTCATGACATTAACCTATAAAAATAGGCGT

FIGURE 11C-1

1-845 CMVpormoter/R/U5 5' LTR
 1322 GAG ATG-ATC mutation
 850-2100 extended \square region
 2146-2173 two Bstx1 peptide cloning sites
 2173-2214 EoR1/Hpa1/Hpa1/Not1 polylinker
 2262-2855 3' LTR
 2855-4901 pGEM backbone (pUC origin, ampR)

ATCACGAGGCCCTTTTCGTCTTCAAGAACAGCTTTGCTCTTAGGAGTTTCCTAATACATCCCAAACCTCAAAT--
 ATATAAAGCATTTGACTTGTTCTATGCCCTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAG
 CCATATATGGAGTTCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCG
 CCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGG
 TGGAGTATTTACGGTAAACTGCCCCTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATT
 GACGTCAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTTCCTACTTG
 GCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTG
 GATAGCGGTTTTGACTCACGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCAC
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 CGATTGACTGAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTGCAGTTGCATCCGACTTGTGGTCT
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 TCTGTGTCTGTCCGATTGTCTAGTGTCTATGACTGATTTTTATGCGCCTGCGTCCGTACTAGTTAGCTAACT
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 TAACCGAGACCTCATCACCCAGGTTAAGATCAAGGTCTTTTACCTGGCCCGCATGGACACCCAGACCAGG
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 AAGCCTCCGCCTCCTCTTCTCCATCCGCCCCGTCTCTCCCCCTTGAACCTCCTCGTTGACCCCCGCTCG
 ATCCTCCCTTTATCCAGCCCTCACTCCTTCTCTAGGCGCCCCCATATGGCCATATGAGATCTTATATGGGG
 CACCCCCGCCCCCTTGTAACCTTCCCTGACCTTGACATGACAAGAGTTACTAACAGCCCCCTCTCTCCAAGCT
 CACTTACAGGCTCTCTACTTAGTCCAGCACGAAGTCTGGAGACCTCTGGCGGCAGCCTACCAAGAACAACT
 GGACCGACCGGTGGTACCTCACCTTACCGAGTCGGCGACACAGTGTGGGTCCGCGGACACCAGACTAAGA
 ACCTAGAACCTCGCTGGAAGGACCTTACACAGTCTGCTGACCACCCCCACCGCCCTCAAAGTAGACGGC
 ATCGCAGCTTGGATACACGCGCCACGTGAAGGCTGCCGACCCCGGGGTGGACCATCCTCTAGACTGCC
 GGATCTCGAGGGATCCACCACCATGGACCCCCATTAAATTGGAATTCGGGGCCCAAGCTTTGTAAACGTGCG
 ACGCGGCCGCGCTCGACGATAAAATAAAAGATTTTATTTAGTCTCCAGAAAAAGGGGGAATGAAAGACCC
 CACCTGTAGGTTTGGCAAGCTAGCTTAAGTAACGCCATTTTGCAAGGCATGGAAAAATACATAACTGAGAA
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 AGCAGTTCTGCCCCGGCTCAGGGCCAAGAACAGATGGAACAGCTGAATATGGGCCAAACAGGATATCTGT
 GGTAAGCAGTTCTGCCCCGGCTCAGGGCCAAGAACAGATGGTCCCCAGATGCGGTCCAGCCCTCAGCAGT
 TTCTAGAGAACCATCAGATGTTTCCAGGGTGCCCCAAGGACCTGAAATGACCCTGTGCCTTATTTGAACTA
 ACCAATCAGTTTCGCTTCTCGCTTCTGTTTCGCGCGCTTCTGCTCCCCGAGCTCAATAAAAGAGCCCAAC
 CCTCACTCGGGGCGCCAGTCCTCCGATTGACTGAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTG

11C-1

CAGTTGCATCCGACTTGTGGTCTCGCTGTTCCCTTGGGAGGGTCTCCCTCTGAGTTGACTACCCGTCAGC
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CAGCGGGGTCTTCACATGCAGCATGTATCAAAATTAATTTGGTTTTTTTTTCTTAAGTATTTACATTAAAT
GGCCATAGTTGCATTAATGAATCGGCCAACGCGCGGGGAGAGCGGTTTTCGCTATTGGCGCTCTTCCGCTT
CCTCGCTACTGACTCGCTGCGCTCGGTCTGGTTCGGTGCAGGCGAGCGGTATCAGCTCACTCAAAGGCGGTA
ATACGGTATTCCACAGAATAACAGGGGATAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAG
GAACCGTAAAAAGGCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATC
GACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCC
CTCGTGCGCTCTCCTGTTCCGACCCGCGCTTACCGGATACCTGTCCGCTTTCTCCCTTCGGGAAGCGT
GGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTTCGCTCCAAGCTGGGCTGTG
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CGGAAATGTTGAATACTCATACTCTTCCTTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCAT
GACATTAACCTATAAAAAATAGGCGT

FIG 12A

(1) C12ScFas Survival construct

C12ScFas: epsilon-cFas(CD95)-Ires-Hygro-BGH PolyA put into C12s vector backwards so that no leaky transcription happens through the cmv promoter.

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atttgacttgttctatgcccctagtttattaatagtaataacacggggtcattagttcattagcccatatattggagttccg
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CAGGGTGCAGTTTGTTCCTTCTAAACCATGCTCTTCATCGCAGAGTGTGCATCTTCTGCATTTATCAGCATAATGGT

TCTTGTCCATGTACTCCTTCCCTTCTGTGCATGGGGCACAGGTGGTGTACCCCCATTCAATTTGCAGTCTCTCAACTTTT

Parameter	Value	Unit
α	0.001	
β	0.001	
γ	0.001	
δ	0.001	
ϵ	0.001	
ζ	0.001	
η	0.001	
θ	0.001	
ι	0.001	
κ	0.001	
λ	0.001	
μ	0.001	
ν	0.001	
ξ	0.001	
\omicron	0.001	
π	0.001	
ρ	0.001	
σ	0.001	
τ	0.001	
υ	0.001	
ϕ	0.001	
χ	0.001	
ψ	0.001	
ω	0.001	
Ω	0.001	
Θ	0.001	
Υ	0.001	
Φ	0.001	
Ψ	0.001	
Ξ	0.001	
\Omicron	0.001	
Π	0.001	
Σ	0.001	
Υ	0.001	
Φ	0.001	
Ψ	0.001	
Ξ	0.001	
\Omicron	0.001	
Π	0.001	
Σ	0.001	
Υ	0.001	
Φ	0.001	
Ψ	0.001	
Ξ	0.001	
\Omicron	0.001	
Π	0.001	
Σ	0.001	
Υ	0.001	
Φ	0.001	
Ψ	0.001	
Ξ	0.001	
\Omicron	0.001	
Π	0.001	
Σ	0.001	
Υ	0.001	
Φ	0.001	
Ψ	0.001	
Ξ	0.001	
\Omicron	0.001	
Π	0.001	
Σ	0.001	
Υ	0.001	
Φ	0.001	
Ψ	0.001	
Ξ	0.001	
\Omicron	0.001	
Π	0.001	
Σ	0.001	
Υ	0.001	
Φ	0.001	
Ψ	0.001	
Ξ	0.001	
\Omicron	0.001	
Π	0.001	
Σ	0.001	
Υ	0.001	
Φ	0.001	
Ψ	0.001	
Ξ	0.001	
\Omicron	0.001	
Π	0.001	
Σ	0.001	
Υ	0.001	
Φ	0.001	
Ψ	0.001	
Ξ	0.001	
\Omicron	0.001	
Π	0.001	
Σ	0.001	
Υ	0.001	
Φ	0.001	
Ψ	0.001	
Ξ	0.001	
\Omicron	0.001	
Π	0.001	
Σ	0.001	
Υ	0.001	
Φ	0.001	
Ψ	0.001	
Ξ	0.001	
\Omicron	0.001	
Π	0.001	
Σ	0.001	
Υ	0.001	
Φ	0.001	
Ψ	0.001	
Ξ	0.001	
\Omicron	0.001	
Π	0.001	
Σ	0.001	
Υ	0.001	
Φ	0.001	
Ψ	0.001	
Ξ	0.001	
\Omicron	0.001	
Π	0.001	
Σ	0.001	
Υ	0.001	

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TTAAATTAAAAATGAAGTTTGCGCAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAAT
CAGTGAGGCACCTATCTCAGCGATCTGTCTATTTTCGTTTCATCCATAGTTGCTGACTCCCCGTCGTGTAGATAACTACGA
TACGGGAGGGCTTACCATCTGGCCCCAGTGTGCAATGATACCGCGAGACCCACGCTCACC GGCTCCAGATTATCAGCA
ATAAACGACGCCGCGGAAGGGCCGAGCGCAGAAGTGGTCTTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTG
CCGGAAGCTAGAGTAAGTAGTTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTAC
GCTCGTCGTTTGGTATGGCTTCATTACGCTCCGGTTCCTCAACGATCAAGGCGAGTTACATGATCCCCATGTTGTGCAAA
AAAGCGGTTAGCTCCTTCGGTCTCCGATCGTTGTGAGAAGTAAGTTGGCCGAGTGTTTACTACTCATGGTTATGGCAGC

FIG 12C

ACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGagtactcaaccaagtcattctgag

aatagtgtatgcgggcgaccgagttgctcttgcggcggtcaacacgggataataccgcgccacatagcagaactttaaaa
gtgctcatcattggaaaacgttcttcggggcgaaaactctcaaggatcttaccgctgttgagatccagttcgatgtaacc
cactcgtgcacccaactgatcttcagcatcttttactttcaccagcggttctggtgagcaaaaacaggaaggcaaaatg
cgcaaaaaagggaataagggcgacacggaaatgttgaatactcatactcttcctttttcaatattattgaagcatttat
cagggttattgtctcatgacattaacctataaaaataggcgt

1000 900 800 700 600 500 400 300 200 100 0

[illegible]

2.) Ahhhh: epsilon-cFas' (CD8 or mLyt2)-Ires-Hygro-BGHpolyA also in C12s backwards

TGCTATTGTCTTCCCAATCCTCCCCCTTGCTGTCCTGCCCCACCCCACCCCCAGAATAGAATGACACCTACTCAGACAA

TGCGATGCAATTCCTCATTTTATTAGGAAAGGACAGTGGGAGTGGCACCTTCCAGGGTCAAGGAAGGCACGGGGGAGGG

GCAAACAACAGATGGCTGGCAACTAGAAGGCACAGTCGAGGtCTAGCTTGCCAAACCTACAGGTGGGGTCTTTCATTCCC

ccaagctttggatttcatttctgaagtttgaattttctgagtcactagtaaatgtccttgaggatgatagtctgaatttctctgcaagagtacaaagattggcttttttgagatctttaatcaatgtgtcatacgtctctttcttccatgaagttgatgccaattacgaagcagttgaactttctgttctgctgtgtcttggaattgtcattcttgatctcatctattttggcttcattgacaccattctttcgaacaaagcctttaacttgacttagtgtcatgactccagcaatagtggatataatttactcaag

F15-13B

tcaacatcagataaaatttattgcccactgtttcaggatttaaggttgagattcatgagaaccttggttttcccttctgtg
ctttctgcatgttttctgtacttcccttctcttcccccacaaatattagtggaattggcaaaagaagaagacaaagccacc
ccaaccggtttccggtcccttctactgagccacggggccgacaatcttctggtctctggggctgagatgtcccggtaggg
tgcacaggtgagggagttcgcagcactggcttggtagtagtagagttcactttctgaaggactggcacgacagaactgaa
gtacatcaccgagttgtgatgactgagcagaaaatagtagccttctgttttccctgtgtaacttgttcagggtgagaactg
acttattattcgtgtccctcatggcagaaaacagtttcgacgaattcagcttctcgtcccacgttatcttgttgtgggat
gaagccatatagacaacgaaggtgggctgggggagtttgagctggagttctggaagagccaagagcatccttgcgaac
ggacccaacacttcacataaccaggtccaccttctgaccaagtctggcgctccatcttcttggaaagattcggaggttcgg
gtgctgtggcttagcttctccactccccaggataatcgactcaccagcagcagcaggttcagcgcagacgaaagcgggtc
aacggtgagggccatgGTGGCTTTACCAACAGTACCGGAATGCCAAGCTTGCGGCCGCTTAAGAGCTGTAATTGAACCTGG

GAGTGGACACCTGTGGAGAGAAAGGCAAAGTGGATGTACAGTAAGACCAATAGGTGCCTATCAGAAACGCAAGAGTCTTCT

CTGTCTCGACAAGCCCAGTTTCTATTGGTCTCCTTAAACCTGTCTTGTAACCTTGATACTTACCTGCCAGTGCCTCAGC

ACCAACTTctgcaggaattcctggacagctcccagatgatcagtaaccgtggttgttatttctgtgcccgggcagtgaggc
ctgggtagggggagctctgcctcagtgttttcagctaaaaatggggtgggaaccccCaggaggcccgggcccgcctggaa
gttcccttttctctctgttcttgggaagtcgatttgagcaacacgggggtcaggtgaggtccttccactaccgatgcaca
ccgagtgctGggggaggttctcttctctctcaggcccaacCccaggggccctgcctaggtcccggactctCactcttgac
gcatgctggcttgggtggctccagtcagcaaaacttggggtcccgttgcctgggaaagggagaggggtactgggcatcgacg
cctctgcttccacgaaagccttgtgaagaaaggtggggggcgttcttgtgcaggagaatgaggcgactgaggtgaactg
gcctcggggGcgcgtgtcccagatgtgtgtgcagggcctcctgatggcgagccctcgtccctgtgacaaagccttggag
ctggcaccctgagtggtggcctcacCTGTACTACTCCCAGGTCACTGTCTcgcacGCGGCCGCTCGAcgataAAAATAA

AAGATTTTATTAGTCTCCAGAAAAAGGGGGGAATGAAAGACCCACCTGTAGGTTTGGCAAgtagcTTAAGTAACCCA

TTTTGCAAGGCATGAAAAATACATAACTGAGAAATAGAGAAGTTCAGATCAAGGTCGGAACAGATGGAACAGGCAATAAA

AGAGCCCACAACCCCTCACTCGGGGCGCCAGTCTCCGATTGACTGAGTCGCCCCGGGTACCCGTGTATCCAATAAACCT

CTTGACAGTTGCATCCGACTTGTGGTCTCGCTGTTCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGTGACGGGGG

TCTTTCaactgcaGCATGTATCAAAATTAATTTGGTTTTTTTTCTTAAGTATTTACATTAAATGGCCATagtttcGTAAT

CATGGTCATAGCTGTTTCTGTGTGAAATGTGTATCCGCTCACAATTCACACAACATACGAGCCGGAAGCATAAAGTGT

AAAGCCTGGGGTGCCTAATGAGTGAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCCCGCTTCCAGTCGGGAAACCT

GTCGTGCCAGCTGCATTAATGAATCGGCCAACCGCGGGGAGAGGCGGTTTGGCTATTGGGCGCTCTTCCGCTTCTCTCGC

TCACTGACTCGCTGCGCTCGGTGCTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAATACGGTTATCCACA

GAATCAGGGGATAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCT

GGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAG

GACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCTGTTCCGACCTGCGGCTTACCGGATAC

CTGTCCGCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTGCT

TCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCGTTACGCCCCAGCGCTGCGCCTTATCCGGTAACATCGTCTTGAGT

CCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGT

GCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCC

AGTTACCTTCGGAAGAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTGTTGCA

AGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGAAC

GAAAACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAG

TTTGCGCAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCT

CAGCGATCTGTCTATTTCTGTTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCA

TCTGGCCCCAGTGTGCAATGATACCGCGAGACCCACGCTACCGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGG

AAGGGCCGAGCGCAGAAGTGGTCTTATCCGCTCCATCCAGTCTATTAATTGTTGCCGGAAGCTAGAGTAA

GTAAGTTGCCAGTTAATAGTTTGGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTACGCTCGTCTTGGTATG

2025 JUN 11 10:00 AM

FIG 13C

GCTTCATT CAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTT
CGGTCCTCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTA
CTGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGagtactcaaccaagtcattctgagaatagtgtatgcggcga
ccgagttgctcttgcccggcgtcaacacgggataataccgcgccacatagcagaactttaaaagtgctcatcattggaaa
acgttcttcggggcgaaaactctcaaggatcttaccgctgttgagatccagttcgatgtaaccactcgtgcaccaact
gatcttcagcatcttttactttcaccagcgtttctgggtgagcaaaaacaggaaggcaaaatgccgcaaaaaagggaata
agggcgacacggaaatggtgaatactcatactcttcctttttcaatattattgaagcatttatcagggttattgtctcat
gacattaacctataaaaaataggcgt

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